

LISTING OF THE CLAIMS

This listing of claims, including the amendments indicated below, replaces all prior versions, and listings, of claims in the application

1-49. (Canceled)

50. (Currently Amended) An optical-spectrum flattening method characterized by comprising:

a first step of obtaining a discrete spectrum of a mode spacing corresponding to a repetition frequency Δf using an output light obtained by modulating an amplitude or phase of a continuous wave (CW) output from a single-wavelength light source using ~~[[a]]~~ the repetition frequency Δf ; ~~or an output light output from a pulse light source or an optical pulse output circuit for outputting a pulsed light of the repetition frequency Δf ; and~~

a second step of modulating said discrete spectrum of the mode spacing Δf by frequency Ω , while $\Omega < 2f_m$, when a band of said discrete spectrum is $2f_m$.

51. (Currently Amended) An optical-spectrum flattening method according to claim 50, characterized in that wherein:

the repetition frequency Δf ~~and a light of a pulse width (full width at half maximum[[D]])~~ t_0 have a relationship $t_0 \ll (1/\Delta f)[[.]]$; and

the pulse width (full width at half maximum) ~~of a~~ of the light pulse is expanded.

52. (Currently Amended) An optical-spectrum flattening method according to claim 51, characterized in that wherein:

the pulse width (full width at half maximum) ~~of a~~ of the light pulse is expanded using a dispersive medium.

53. (Currently Amended) An optical-spectrum flattening method according to claim 50, characterized in that wherein:

during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

54. (Currently Amended) An optical-spectrum flattening method according to claim 53, ~~characterized in that~~ wherein:

said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

55. (Currently Amended) An optical-spectrum flattening method according to claim 54, ~~characterized in that~~ wherein:

the signal voltage from said oscillator is a sinusoidal wave.

56. (Currently Amended) An optical spectrum flattening method according to claim 54, ~~characterized in that~~ wherein:

~~[[if]]~~ a phase modulator is used during said second step~~[[,]]~~; and
a frequency shift of said discrete spectrum is regulated by varying a modulation index.

57. (Currently Amended) An optical-spectrum flattening method according to claim ~~[[54]]~~ 56, ~~characterized in that~~ wherein:

~~[[the]]~~ a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to multiply or divide an output signal from the oscillator to ~~varying~~ vary a modulated frequency thereof.

58. (Currently Amended) An optical-spectrum flattening method according to claim 54, ~~characterized in that~~ wherein:

a phase modulator is used during said second step~~[[,]]~~; and

level deviations among modes are regulated by causing the phase modulator to shift a phase of a modulating signal for driving the modulator.

59. (Currently Amended) An optical-spectrum flattening method according to claim 53, characterized in that wherein:

a combination of a first modulator ~~A for modulating~~ is used to modulate the amplitude or phase of said continuous wave (CW) output from said single-wavelength light source; and

a second modulator ~~B for modulating~~ is used to modulate an amplitude or phase of a modulated wave from the first modulator ~~A is used in all cases~~.

60. (Currently Amended) An optical-spectrum flattening apparatus characterized by comprising:

first means for obtaining a discrete spectrum of a mode spacing corresponding to a repetition frequency Δf using an output light obtained by modulating an amplitude or phase of a continuous wave (CW) output from a single wavelength light source using ~~[[a]] the repetition frequency Δf ; or an output light output from a pulse light source or an optical pulse output circuit for outputting a pulsed light of the repetition frequency Δf ; and~~

second means for modulating said discrete spectrum of the mode spacing Δf with a frequency Ω , while $\Omega < 2\Delta f$, when a band of said discrete spectrum is $2\Delta f$.

61. (Currently Amended) An optical-spectrum flattening apparatus according to claim 60, characterized in that wherein:

the repetition frequency Δf and a light of a ~~pulse width (full width at half maximum[()])~~ t_0 have a relationship $t_0 \ll (1/\Delta f)$; and, ~~the pulse width (~~

the full width at half maximum) of a of the light pulse is expanded.

62. (Currently Amended) An optical-spectrum flattening method according to claim 51, characterized in that wherein:

during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

63. (Currently Amended) An optical-spectrum flattening method according to claim 52, ~~characterized in that~~ wherein:

during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

64. (Currently Amended) An optical-spectrum flattening method according to claim 62, ~~characterized in that~~ wherein:

said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

65. (Currently Amended) An optical-spectrum flattening method according to claim 63, ~~characterized in that~~ wherein:

said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

66. (Currently Amended) An optical-spectrum flattening method according to claim 64, ~~characterized in that~~ wherein:

the signal voltage from said oscillator is a sinusoidal wave.

67. (Currently Amended) An optical-spectrum flattening method according to claim 65, ~~characterized in that~~ wherein:

the signal voltage from said oscillator is a sinusoidal wave.

68. (Currently Amended) An optical-spectrum flattening method according to claim 64, ~~characterized in that~~ wherein:

[[if]] a phase modulator is used during said second step[[.]]; and

a frequency shift of said discrete spectrum is regulated by varying a modulation index.

69. (Currently Amended) An optical-spectrum flattening method according to claim 65, ~~characterized in that~~ wherein:

~~[[if]]~~ a phase modulator is used during said second step~~[[,]]~~; and
a frequency shift of said discrete spectrum is regulated by ~~varying~~ vary a modulation index.

70. (Currently Amended) An optical-spectrum flattening method according to claim ~~[[65]]~~ 69, ~~characterized in that~~ wherein:

~~[[the]]~~ a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to multiply or divide an output signal from the oscillator to ~~varying~~ vary a modulated frequency thereof.

71. (Currently Amended) An optical-spectrum flattening method according to claim 65, ~~characterized in that~~ wherein:

~~[[the]]~~ a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to multiply or divide an output signal from the oscillator to ~~varying~~ vary modulated frequency thereof.

72. (Currently Amended) An optical-spectrum flattening method according to claim 64, ~~characterized in that~~ wherein:

a phase modulator is used during said second step~~[[,]]~~; and
level deviations among modes are regulated by causing the phase modulator to shift a phase of a modulating signal for driving the modulator.

73. (Currently Amended) An optical-spectrum flattening method according to claim 65, ~~characterized in that~~ wherein:

a phase modulator during said second step~~[[,]]~~; and
level deviations among modes are regulated by causing the phase modulator to shift a phase of a modulating signal for driving the modulator.

74. (Currently Amended) An optical-spectrum flattening method according to claim 62, characterized in that wherein:

~~a combination of a first~~ modulator ~~A~~ for is used for modulating the amplitude or phase of said continuous wave (CW) output from said single-wavelength light source; and

a second modulator [[B]] is used for modulating an amplitude or phase of a modulated wave from the first modulator ~~A is used in all cases~~.

75. (Currently Amended) An optical-spectrum flattening method according to claim 63, characterized in that wherein:

~~a combination of a first~~ modulator [[A]] is used for modulating the amplitude or phase of said continuous wave (CW) output from said single-wavelength light source; and

a second modulator [[B]] is used for modulating an amplitude or phase of a modulated wave from the modulator ~~A is used in all cases~~.

76. (New) An optical-spectrum flattening method comprising:

a first step of obtaining a discrete spectrum of a mode spacing corresponding a repetition frequency Δf using an output light from a pulse light source or an optical pulse output circuit for outputting a pulsed light of the repetition frequency Δf ; and

a second step of modulating said discrete spectrum of the mode spacing Δf by frequency Ω , while $\Omega < 2\Delta f$, when a band of said discrete spectrum is $2\Delta f$.

77. (New) An optical-spectrum flattening method according to claim 76, wherein:

the repetition frequency Δf and a light pulse of a full width at half maximum t_0 have a relationship $t_0 \ll (1/\Delta f)$; and

the full width at half maximum of the light pulse is expanded.

78. (New) An optical-spectrum flattening method according to claim 77, wherein:

the full width at half maximum of the light pulse is expanded using a dispersive medium.

79. (New) An optical-spectrum flattening method according to claim 76, wherein:
during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

80. (New) An optical-spectrum flattening method according to claim 79, wherein:
said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

81. (New) An optical-spectrum flattening method according to claim 80, wherein:
the signal voltage from said oscillator is a sinusoidal wave.

82. (New) An optical-spectrum flattening method according to claim 80, wherein:
a phase modulator is used during said second step; and
a frequency shift of said discrete spectrum is regulated by varying a modulation index.

83. (New) An optical-spectrum flattening method according to claim 82, wherein:
a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to multiply or divide an output signal from the oscillator to vary a modulated frequency thereof.

84. (New) An optical-spectrum flattening method according to claim 80, wherein:
a phase modulator is used during said second step; and
level deviations among modes are regulated by causing the phase modulator to shift a phase of a modulating signal for driving the modulator.

85. (New) An optical-spectrum flattening method according to claim 79, wherein:
a first modulator is used to modulate the amplitude or phase of said light output from said pulse light source or said pulse output circuit; and
a second modulator is used to modulate an amplitude or phase of a modulated wave from the first modulator.

86. (New) An optical-spectrum flattening apparatus comprising:

first means for obtaining a discrete spectrum of a mode spacing corresponding a repetition frequency Δf using an output light output from a pulse light source or an optical pulse output circuit for outputting a pulsed light of the repetition frequency Δf ; and

second means for modulating said discrete spectrum of the mode spacing Δf with a frequency Ω , while $\Omega < 2 \Delta f$, when a band of said discrete spectrum is $2 \Delta f$.

87. (New) An optical-spectrum flattening apparatus according to claim 86, wherein:

the repetition frequency Δf and a light pulse of a full width at half maximum t_0 to have a relationship $t_0 \ll (1/\Delta f)$; and

the full width at half maximum of the light pulse is expanded.

88. (New) An optical-spectrum flattening method according to claim 77, wherein:

during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

89. (New) An optical-spectrum flattening method according to claim 78, wherein:

during said second step, a modulator is used which modulates an amplitude or phase of a temporal waveform composed of said discrete optical spectrum.

90. (New) An optical-spectrum flattening method according to claim 88, wherein:

said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

91. (New) An optical-spectrum flattening method according to claim 89, wherein:

said modulator for modulating the amplitude or phase is driven by a signal voltage output from an oscillator at a particular frequency.

92. (New) An optical-spectrum flattening method according to claim 90, wherein:

the signal voltage from said oscillator is a sinusoidal wave.

93. (New) An optical-spectrum flattening method according to claim 91, wherein:
the signal voltage from said oscillator is a sinusoidal wave.

94. (New) An optical-spectrum flattening method according to claim 90, wherein:
a phase modulator is used during said second step; and
a frequency shift of said discrete spectrum is regulated by varying a modulation index.

95. (New) An optical-spectrum flattening method according to claim 91, wherein:
a phase modulator is used during said second step; and
a frequency shift of said discrete spectrum is regulated by varying a modulation index.

96. (New) An optical-spectrum flattening method according to claim 90, wherein:
a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to
multiply or divide an output signal from the oscillator to vary a modulated frequency thereof.

97. (New) An optical-spectrum flattening method according to claim 91, characterized in
that:
a frequency shift of said discrete spectrum is regulated by causing a multiplier or a divider to
multiply or divide an output signal from the oscillator to vary a modulated frequency thereof.

98. (New) An optical-spectrum flattening method according to claim 90, wherein:
a phase modulator is used during said second step; and
level deviations among modes are regulated by causing the phase modulator to shift a phase
of a modulating signal for driving the modulator.

99. (New) An optical-spectrum flattening method according to claim 91, wherein:
a phase modulator is used during said second step; and

level deviations among modes are regulated by causing the phase modulator to shift a phase of a modulating signal for driving the modulator.

100. (New) An optical-spectrum flattening method according to claim 88, wherein:
a first modulator is used to modulate the amplitude or phase of said light output from said pulse light source or said pulse output circuit; and
a second modulator is used to modulate an amplitude or phase of a modulated wave from the first modulator.

101. (New) An optical-spectrum flattening method according to claim 89, wherein:
a first modulator is used to modulate the amplitude or phase of said light output from said pulse light source or said pulse output circuit; and
a second modulator is used to modulate an amplitude or phase of a modulated wave from the first modulator.